

REMARKS

This Application has been carefully reviewed in light of the Final Office Action mailed April 14, 2010. At the time of the Final Office Action, Claims 1-16 were pending in this Application, and Claims 8-9 were previously withdrawn without prejudice or disclaimer. All pending Claims 1-7 and 10-16 were rejected in the Final Office Action. Applicants respectfully request reconsideration and favorable action in this case.

Drawing objections

The drawings were objected to by the Examiner for not explaining an item shown in the Figures 2A, and 3B-E. Applicant respectfully submits that the shown element is not separate from the piezo actuator 31. The element is not relevant for the present invention. Every person skilled in the art knows that a piezoelectric stack of a piezo actuator requires electrical contacts or electrodes. The differently shaded areas merely indicate the electrodes or contact areas on a piezo actuator that provide electrical contact to the piezo stack of the actuator. Such contacts or electrodes may be formed in many different ways and therefore their specific structure and arrangement is not relevant for the present application. Hence, Applicant believes no specific description is required.

Specification objection

The Examiner objected to the previously filed amendment of claims 1 and 10 for allegedly introducing new subject matter. The Examiner in particular states that he cannot see where in the specification it is mentioned that the tube spring is not compressed by the pre-tensioning means. Applicant respectfully disagrees.

The specification clearly describes and also shows the mechanical structure of the assembly. This description clearly shows that the piezoactuator 31 is arranged within the tube 32. On a first end of the tube 32 a first cap is welded to the tube spring 32 and on the opposite end, tube shaped body 38 is also welded to the tube spring 32. Whenever the bolt 39 is screwed into the tube shaped body 38, a force is exerted onto the piezo actuator, for example, via body 37 which can move within tube shaped body 38 towards the piezo actuator 31. This force causes compression of the piezo actuator 31. Because every force causes a

counter force, the opposite force is applied to the tube spring 32. Hence, contrary to the piezo actuator 31 the tube spring 32 is not compressed. (Specification, page 7, line 8-28) Even though the specification does not literally describe which force is applied to the tube spring, the laws of Physics clearly imply that the tube spring is not compressed when bolt 39 is screwed into the tube shaped body 38. Hence, the amendment as filed in the last response is clearly supported by the specification and the drawings.

Rejections under 35 U.S.C. § 112

Claims 1 and 10 were rejected by the Examiner under 35 U.S.C. §112, second paragraph, as being indefinite and failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. Applicant respectfully disagrees. The present invention is directed to an actuator unit with a tube spring and a piezoelectric actuator that is inserted into the tube spring and is pretensioned by the tube spring. (Specification, paragraph [0002], [0003]). Throughout the specification, the term pretensioning is used to describe the compression of the piezoactuator. No other meaning can be implied even though the term pretensioning may be used in other technical fields differently. Applicant can be his own lexicographer and in the present application used the term to describe the force that is exerted on the piezoactuator by the bolt 39. (Specification, paragraph [0035]) Thus, the pretension force is defined as a compression force in the specification. Applicant believes that the specification, in particular paragraphs [0032]-[0038] makes the assembly and function of the actuator unit sufficiently clear to a person skilled in the art.

Rejections under 35 U.S.C. § 102

Claims 1, 4, 10 and 13 stand rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 6,499,471 issued to Jingming Jim Shen et al. (“*Shen*”). Applicant respectfully traverses and submits that *Shen* does not teach all of the elements of the claimed embodiment of the invention.

“A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987). Furthermore, “the identical invention must be shown in as complete detail as is contained in the ... claim.” *Richardson v. Suzuki Motor Co. Ltd.*, 868 F.2d 1226, 1236, 9 U.S.P.Q.2d 1913, 1920 (Fed. Cir. 1989). Applicant respectfully submits that the cited art as anticipated by the Examiner cannot anticipate the rejected Claims, because the cited art does not show all the elements of the present Claims.

Independent Claim 1 includes amongst others the limitations:

- *a tube-shaped body, that is connected to the tube spring by joining and is arranged in the area of a second free end of the tube spring, and*
- *a means for pretensioning the piezoelectric actuator after the tube spring is connected to the first cap and the tube-shaped body, the means for pretensioning being supported by the tube-shaped body and pretensions the piezoelectric actuator by physically compressing the piezoelectric actuator but not the tube spring*

The Examiner states that *Shen* discloses a tube-shaped body with element 15. Applicant respectfully disagrees. Element 15 is described as a “top”. No more explanation is provided by *Shen*. When analyzing Fig. 1, a person skilled in the art would clearly recognize the structure of the actuator unit. Piezoactuator 22 is arranged within a tube spring 17 and enclosed by a top cap 15 and a bottom cap 3. Top 15 is a cap having two openings for connectors that provide electrical connection to the piezoelectric stack. This top 15 is thus comparable to cap 33 of the present application. Top 15 is clearly not “tube shaped” and therefore cannot support any additional means capable of compressing the piezoactuator inside the tube spring 17. A person skilled in the art would therefore recognize that the actuator unit according to *Shen* is already pretensioned and does not comprise any particular pretensioning means. At best *Shen's* top itself, the tube spring 17 and the bottom 3 can be interpreted as means for pretensioning the actuator 22. However, these elements are already defined in the present claim 1. Hence, *Shen* leaves no room for an additional means that is supported by the top.

Applicant clearly claims a means for pretensioning separate from the tube shaped body, the tube spring and the first cap. The means for pretensioning are disclosed in the specification, for example, as bolt 39 which can be screwed into the tube shaped body 38. Thus, it extends into the tube spring 31 depending how far it is screwed in and can apply a force onto the piezoactuator 31. *Shen* does not show any elements other than bottom 3, spring 17 and top 15 and therefore cannot anticipate independent claim 1. The same arguments apply to independent claim 10 which comprises similar limitations.

With respect to claims 4 and 13, this claim requires a thread in the tube-shaped body and that the pretensioning means is a screw that is screwed into the thread. The Examiner merely stated that *Shen* discloses a screw 13. Applicant respectfully disagrees. Screw 13 is described as an adjusting screw and apparently has no connection to top 15. Moreover, top 15 has no thread. The Examiner failed to explain where this thread is located in top 15. As mentioned above, the two openings in top 15 are clearly the openings for the electrical contacts.

In summary, the independent claims are not anticipated by *Shen*. Applicants respectfully submit that the dependent Claims are allowable at least to the extent of the independent Claim to which they refer, respectively. Thus, Applicants respectfully request reconsideration and allowance of the dependent Claims. Applicants reserve the right to make further arguments regarding the Examiner's rejections under 35 U.S.C. §102 or §103(a), if necessary, and do not concede that the Examiner's proposed combinations are proper.

Rejections under 35 U.S.C. §103

Claims 2-3, 5-7, 11-12 and 14-16 stand rejected under 35 U.S.C. §103(a) as being unpatentable over *Shen* in view of U.S. Patent No. 6,326,717 issued to Patrick Mattes (“*Mattes*”).

Claims 6 and 16 were rejected under 35 U.S.C. §103(a) as being unpatentable over *Shen* in view of U.S. Patent Application Publication No. 2002/0056768 filed by Perry Robert Czimmek (“*Czimmek*”).

Applicant respectfully traverses and submits the cited art combinations, even if proper, which Applicant does not concede, does not render the claimed embodiment of the invention obvious.

In order to establish a *prima facie* case of obviousness, the references cited by the Examiner must disclose all claimed limitations. *In re Royka*, 490 F.2d 981, 180 U.S.P.Q. 580 (C.C.P.A. 1974). Even if each limitation is disclosed in a combination of references, however, a claim composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art. *KSR Int'l Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1741 (2007). Rather, the Examiner must identify an apparent reason to combine the known elements in the fashion claimed. *Id.* “Rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *Id.*, citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006). Finally, the reason must be free of the distortion caused by hindsight bias and may not rely on ex post reasoning. *KSR*, 127 S.Ct. at 1742. In addition, evidence that such a combination was uniquely challenging or difficult tends to show that a claim was not obvious. *Leapfrog Enterprises, Inc. v. Fisher-Price, Inc. and Mattel, Inc.*, 485 F.3d 1157, 1162 (Fed. Cir. 2007), citing *KSR*, 127 S.Ct. at 1741.

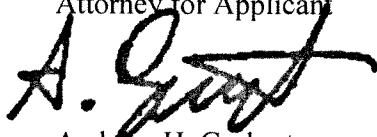
CONCLUSION

Applicant has made an earnest effort to place this case in condition for allowance in light of the remarks set forth above. Applicant respectfully requests reconsideration of the pending claims.

Applicant believes there are no fees due at this time. However, the Commissioner is hereby authorized to charge any fees necessary or credit any overpayment to Deposit Account No. 50-4871 of King & Spalding LLP.

If there are any matters concerning this Application that may be cleared up in a telephone conversation, please contact Applicant's attorney at 512.457.2025.

Respectfully submitted,
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